

Transportation, Handling and Logistical Implications of Bio- engineered Grains and Oilseeds: A Prospective Analysis

Steve Sonka

Chris Schroeder

Carrie Cunningham

The End of the Story

1. Commodity and identity preserved are today's two options. More alternatives are needed and expected.
2. Mismatch exists between investment expectations in biotechnology and market system infrastructure
3. Relationship change along the ag supply change is as needed as physical infrastructure enhancement.

Information Sources

- US Grains Council Value-Enhanced Corn Quality Report
- Informed expert judgement
 - Interviews
 - Focus groups
- Scenarios

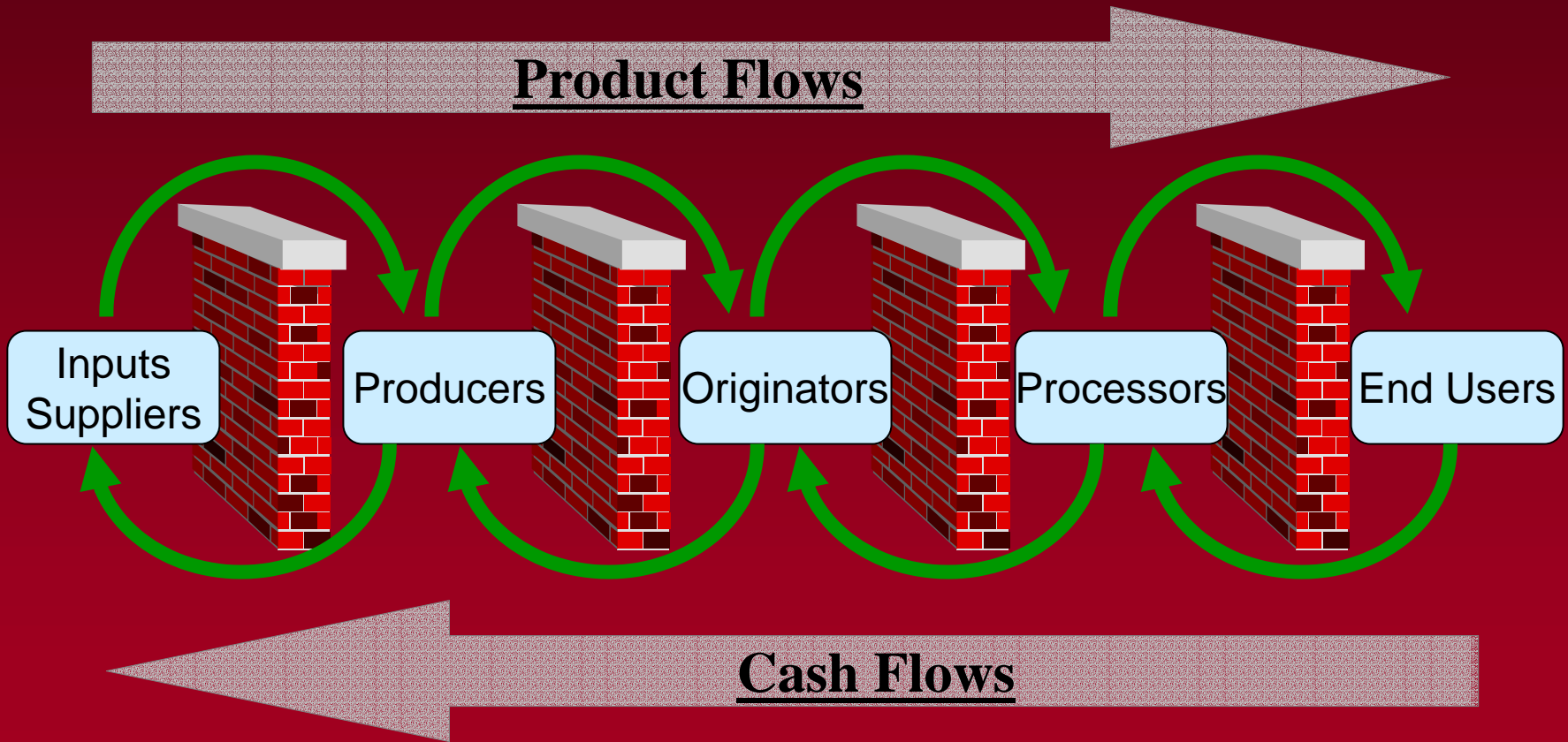
Agenda

- Marketing system alternatives
 - Current
 - Future
- Dynamics of matching infrastructure and value enhanced grain needs
- Pricing implications

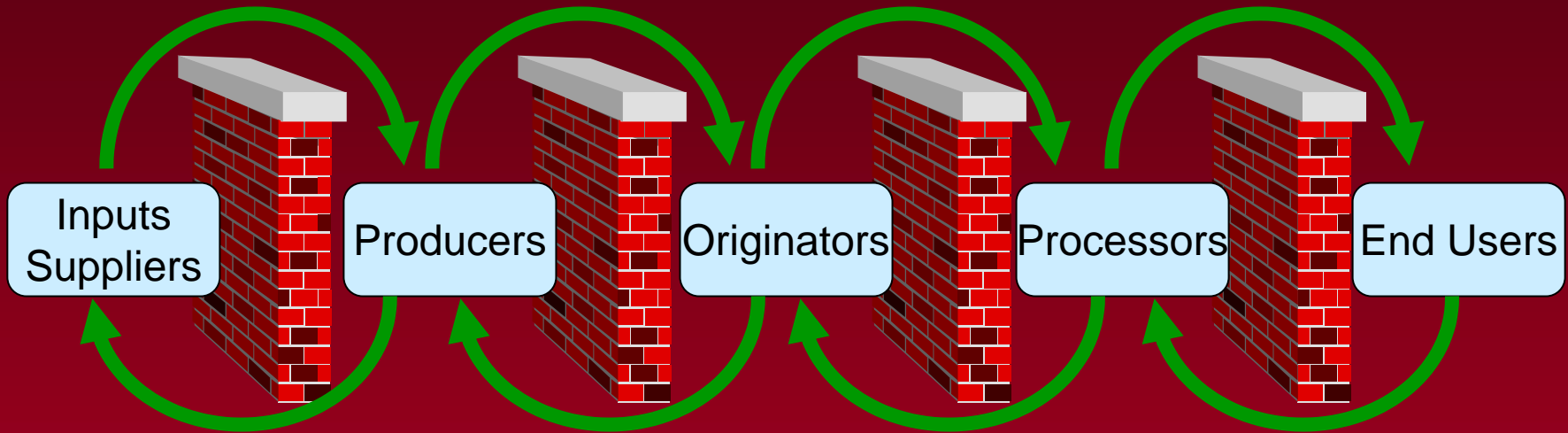
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- **Marketing system alternatives**
 - **Current**
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Traditional Commodity Supply Chain



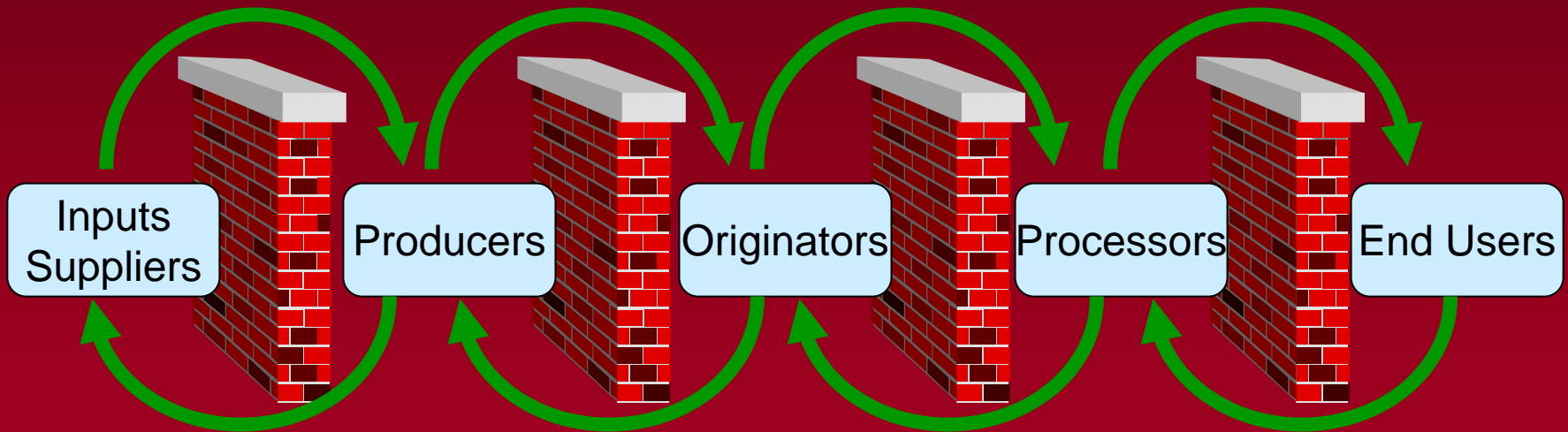
Traditional Commodity Supply Chain



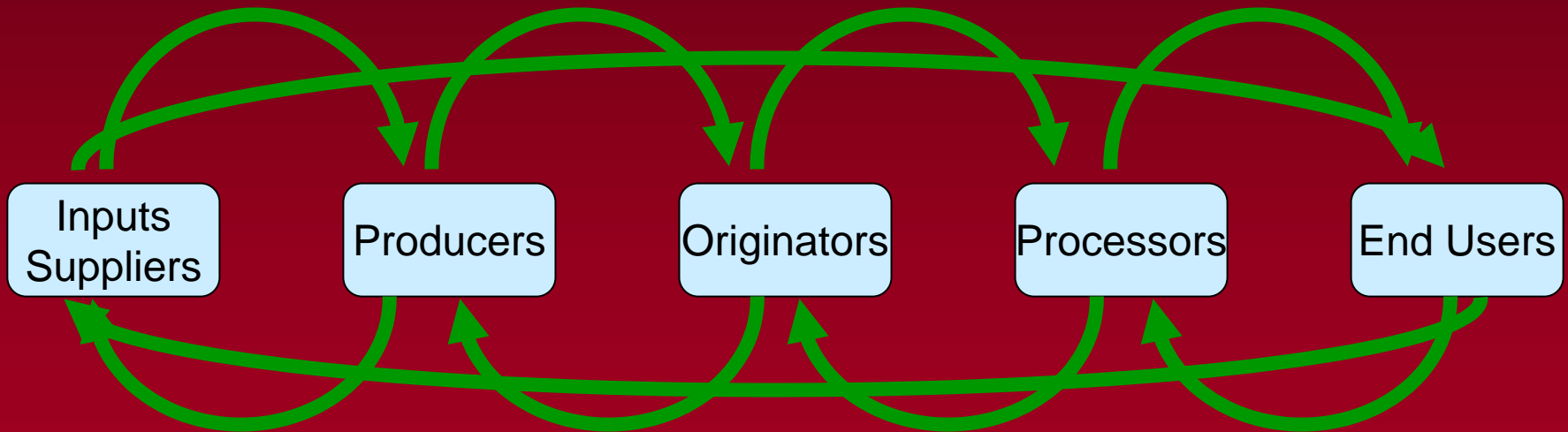
Characteristics:

- Large volumes
- Low cost
- Minimal quality standards
- Purchaser flexibility

Identity Preserved Alternative



Identity Preserved Alternative



Identity Preserved Alternative



Characteristics:

- Small volumes
- Higher cost
- Specific quality standards
- Minimal flexibility

An Economic Gap

Today's alternatives

Commodity:

- Large volumes
- Low cost
- Minimal quality standards
- Purchaser flexibility

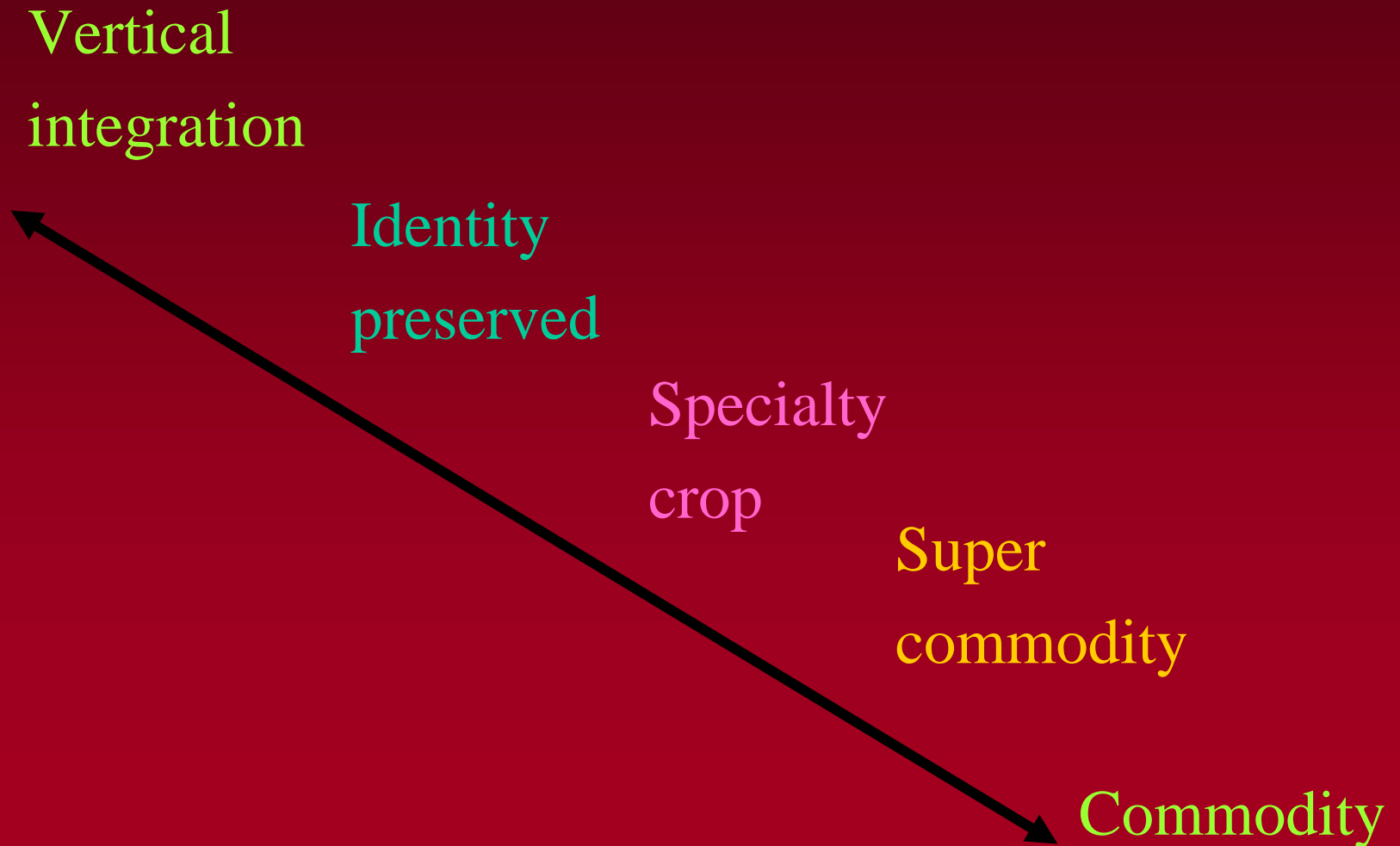
Identity Preserved:

- Small volumes
- Higher cost
- Specific quality standards
- Minimal flexibility

Market wants

- Specific quality standards
- Purchaser flexibility
- Large volumes
- Low cost

Market Channel Alternatives



Market Channel Alternatives

Channel

Differentiating characteristics

Vertical integration	Relative value	Buyer control
Identity preserved	Attribute testing	Types of contract
Specialty crop	Producer linkages	Minimum segregation
Super commodity	Volume	Traceability
Commodity		

Market Channel Alternatives

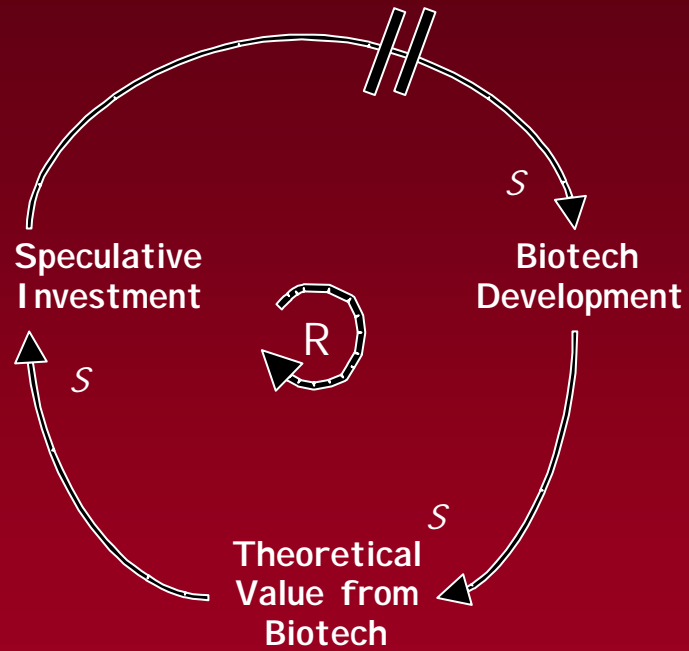
Product Vertical Identity Specialty Super Commodity
 integration preserved crop commodity

Pharm- acetical	X				
High oil corn			Y	X	
Non GMO		X			
High flour wheat			Y	X	
Food grd soy		X	Y		

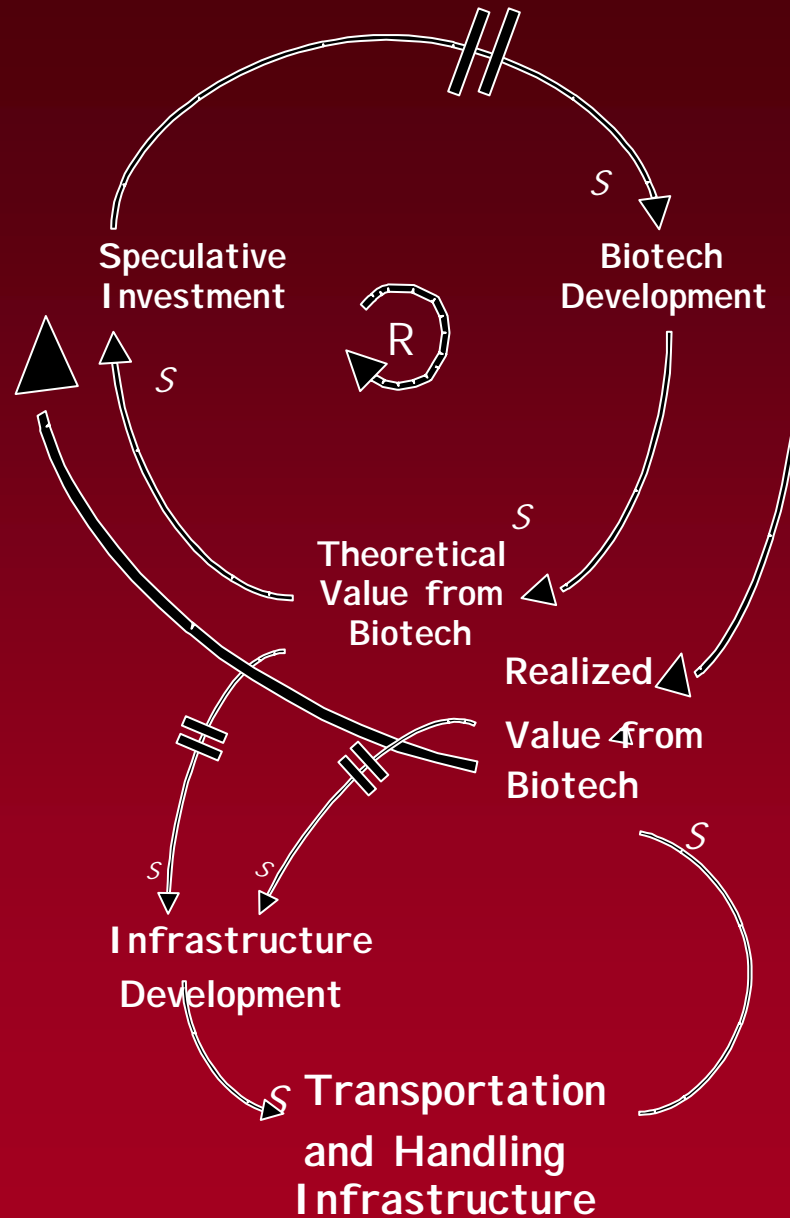
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Biotech View



Biotech and Market View

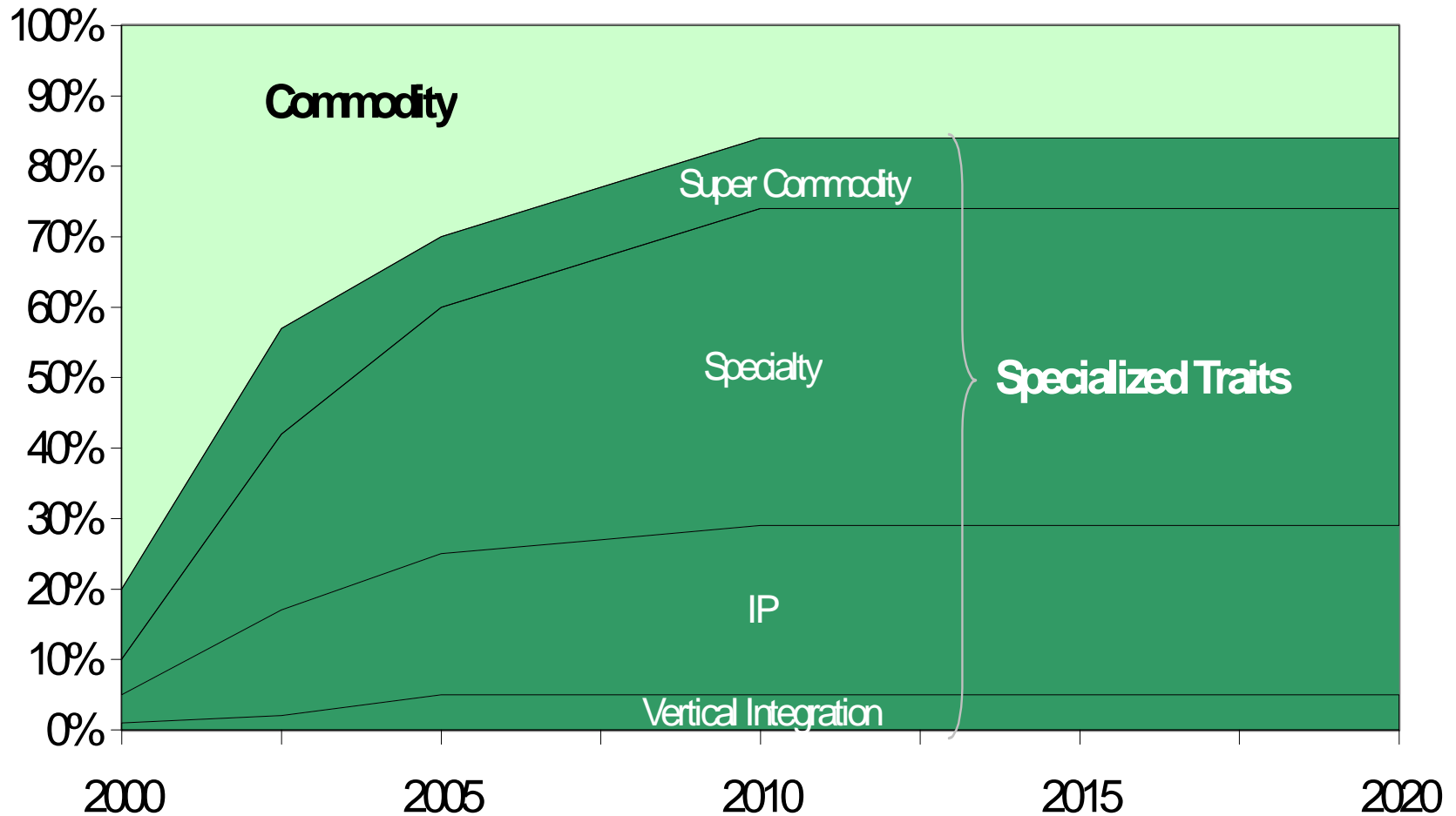


Scenario Descriptions

Characteristic	Scenario 1 Dramatic Shift through Biotech	Scenario 2 Gradual Change without Biotech
Biotechnology enhanced traits	The number of traits explodes.	Developments cease.
Demand for traceability	High, grows quickly	Moderate, grows slowly
Cost of segregation	High	Moderate
Producer alignment with end users	High	Moderate
Relative value of specialty traits	High	Moderate

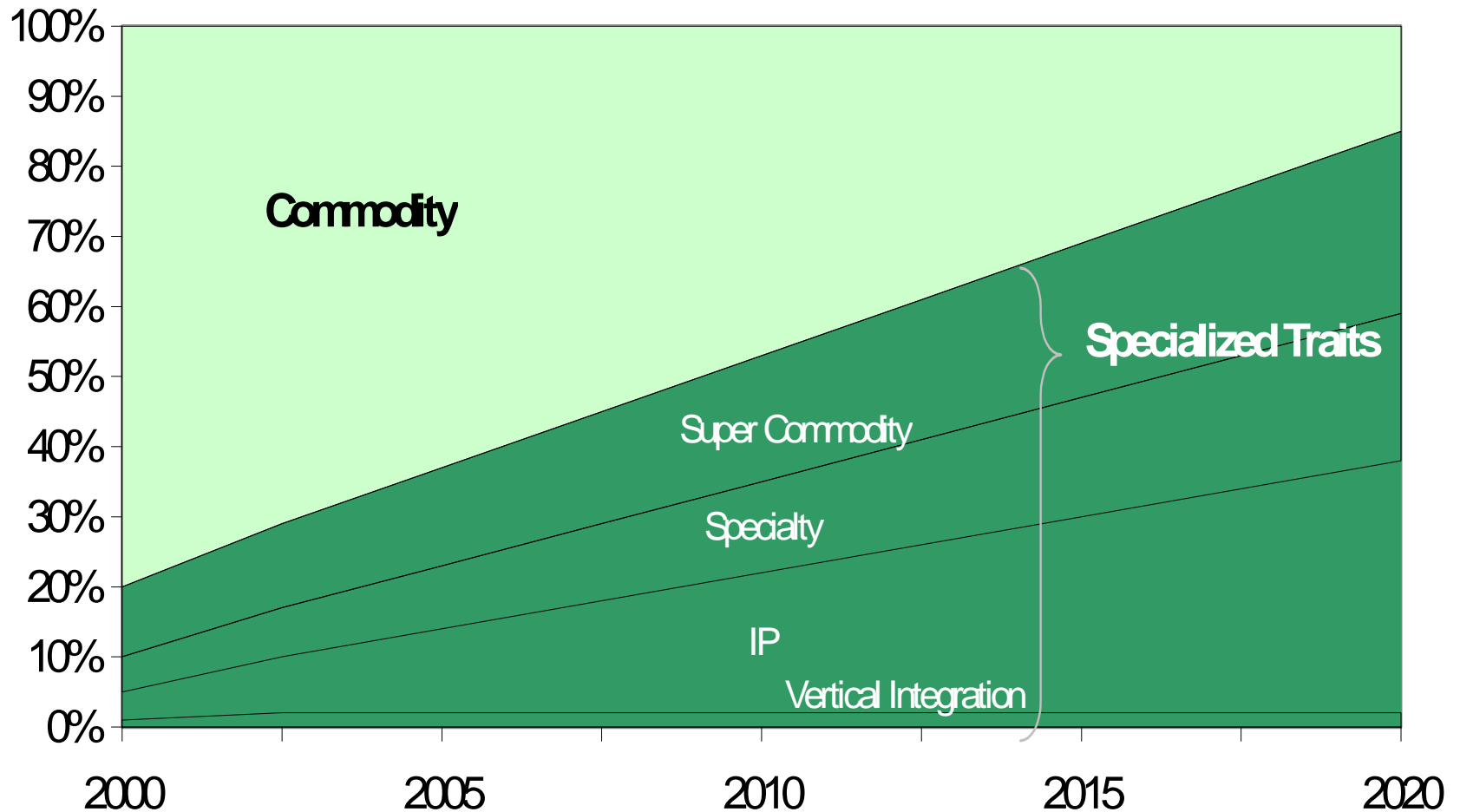
Scenario 1 Over Time

(Figure 15)



Scenario 2 Over Time

(Figure 16)



Agenda

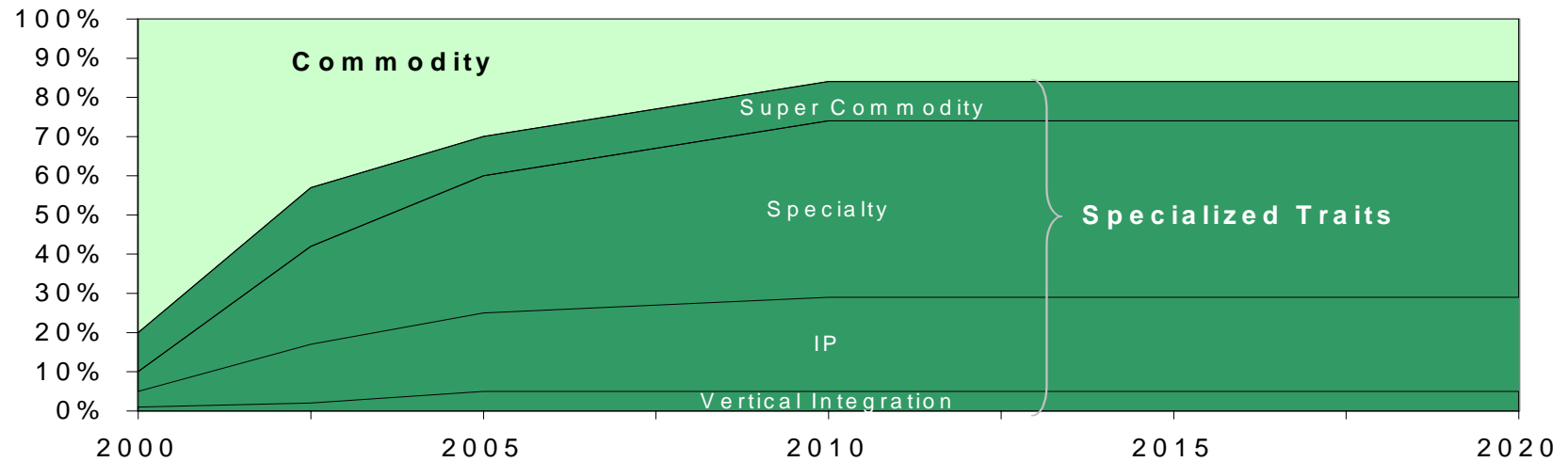
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Pricing “Observations”

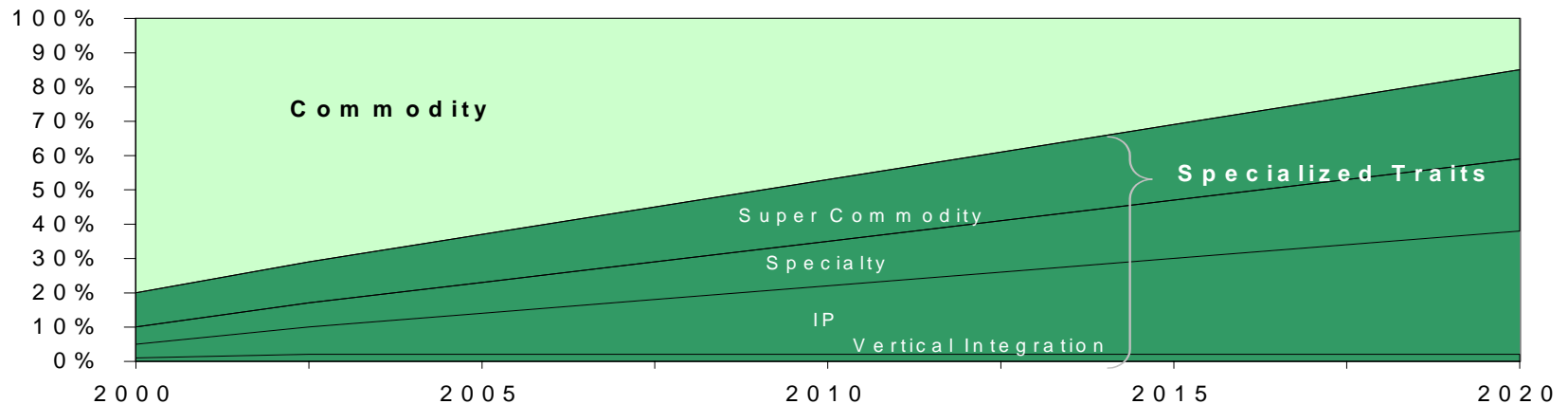
- A reality check
 - Commodity ag is atypical;
 - Rest of world is typical
- Traditionally opportunity cost of land in commodity production sets the standard for identity preservation
 - Is relevant as long as commodity ag is sufficiently large
 - Tipping point change is likely

Pricing Dynamics

Scenario 1



Scenario 2



Summary Thoughts

1. Commodity and identity preserved are today's two options. More alternatives are needed and expected.
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